

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts describing the general climatic conditions in the several States and Territories are taken from the monthly reports of the respective services.

Snowfall and rainfall are expressed in inches.

Alabama.—The month was one of the best experienced in years for harvesting; there was hardly a day on which rain interfered with cotton picking. The only damaging weather conditions were cold and frosts, on a few scattered dates, which were too late to do serious injury. The mean temperature was 60.4°, or 4.4° less than normal. The highest temperature, 99°, occurred at Alco and Brewton on the 6th, and at Healing Springs on the 7th, and the lowest, 27°, at Jasper on the 21st. The prevailing warmest days were the 5th, 6th, and 7th; and the coldest the 21st and 22d. The average precipitation was 2.08, or 0.39 less than normal. The greatest rainfall occurred on the 31st, when there was an average of 0.60 over the entire State. The greatest monthly precipitation, 4.35, was at Jasper, and the least, 0.06, at Thomasville. Frosts occurred on the 1st, 2d, 3d, 4th, 9th, 10th, 20th, 21st, 22d, and 29th.

Arizona.—The mean temperature was 66.6°, or 1.5° above the normal. The highest temperature, 108°, was reported from Fort Mojave and the lowest, 21°, from Flagstaff. The average precipitation was 1.04, or 0.95 in excess of the normal. The greatest amount, 4.68, was recorded at Pinal Ranch, and 0.00 was reported from Flagstaff, Texas Hill, and Parker. Frosts occurred on the 5th, 6th, 11th, 13th, 21st, 22d, 23d, 25th, 26th, 28th, 29th, and 30th.

Arkansas.—The mean temperature was 56.6°, or 4.7° below the normal. The highest temperature reported, 96°, occurred at Helena on the 6th, and the lowest, 21°, at Keesees Ferry on the 29th. The average precipitation, 1.44, is 0.78 below the normal. The greatest amount recorded, 2.91, occurred at Texarkana, and the least, 0.37, at Gaines Landing. Frosts occurred on the 2d, 9th, 10th, 20th, 21st, and 28th.

California.—The mean temperature was 61.5°, only 0.4° above the normal. The highest temperature, 108°, was recorded at Indio, Salton, and Volcano Springs, and the lowest, 6°, at Bodie, in the mountains. The average precipitation was 0.28, or 0.94 below the normal. The greatest monthly amount, 1.59, was recorded at Los Gatos, and the least, 0.00, at a number of places. Frosts occurred at one or more places on every day of the month.

Colorado.—It was cooler than usual over the eastern border counties, the Arkansas Valley, the Divide, Boulder and Routt counties; elsewhere the temperature was generally above the normal, the greatest excess occurred over the mountain districts and the valley of the Rio Grande. The highest temperatures were generally recorded on the 1st and 2d, and the lowest on the 27th and 31st. The average precipitation, 1.04, was 0.19 greater than the normal. Precipitation was general on the western slope on the 21st and 22d, and over the greater part of the State on the 3d, 4th, and 5th. The greatest monthly rainfall, 2.71, was reported from Gold Hill, while 0.00 was reported from Brush and Kirk. Few stations reported snow on the ground at the end of the month. Those reporting appreciable amounts were: Ruby, 5.00, and Gold Hill, 3.00.

Connecticut.—(See *New England*.)

Delaware.—(See *Maryland*.)

District of Columbia.—(See *Maryland*.)

Florida.—The month was characterized by excessive sunshine and a marked deficiency in moisture, the latter causing serious consequences to fall crops. The mean temperature was 78.6°, or 4.0° above the normal. The highest temperature, 92°, was recorded at Kissimmee on the 29th, and the lowest, 44°, at Milton on the 21st, 22d, and 23d. The average precipitation was 3.07, or 1.57 less than normal. The greatest monthly amount, 21.03, occurred at Jupiter, and the least, 0.40, at Lake City.

Georgia.—The month, as usual, was marked by extreme dryness, with clear and pleasant weather. There was a cool wave on the 9th and 10th, and again toward the end of the month. The mean temperature was 59.6°, or about 3° below the normal. The highest temperature, 82°, occurred on the 6th, and the lowest, 38°, on the 13th. The average precipitation was 1.20, or 1.52 less than normal. There were three periods of general rain, 7th and 8th, 11th and 12th, and 27th and 28th, and one period, 30th and 31st, when the rain was confined to the northern counties. Frosts were experienced at intervals at many points in the northern and central counties from the 10th.

Idaho.—The mean temperature was 48.6°. The highest daily temperature, 93°, was recorded at Idaho City on the 1st, and the lowest, 3°, at Chesterfield, on the 27th. The average precipitation was 0.07. The greatest amount, 0.41, was recorded at Swan Valley, and the least, 0.00, at 13 stations.

Illinois.—The month began with low temperatures and was uni-

formly cool, the mean temperature was 48.4°, or 5.4° below the normal; lower than any previous October record for the State. The highest temperature, 86°, was recorded at New Burnside on the 4th, and the lowest, 8°, at Lanark on the 30th, being the lowest ever before recorded in the State for October. There was a marked deficiency in rainfall, the average amount was 0.62, or 2.22 less than the normal, and 0.41 below the lowest previous October record. The greatest monthly amount, 1.52, was recorded at Kankakee, and the least, 0.05, at Rose Hill.

Indiana.—The weather was cool and very dry. The daily mean temperature was above the normal on only a few days. The mean temperature was 47.9°, or 5.0° below the normal. The highest temperature, 84°, occurred at Marengo on the 7th, and the lowest, 10°, at Bluffton on the 30th, which is the lowest minimum recorded for October. Light local rains fell on only a few days. The average amount was 0.73, or 1.64 below the normal. The greatest amount for the month, 1.59, was recorded at Syracuse, and the least, 0.12, at Topeka. The continued drought was very distressing and did much injury to health and to the growing cereals. Rivers, streams, and creeks are very low and navigation on the Ohio River suspended; wells and cisterns dry and stock water scarce in many localities. Snow fell in small quantity in some localities in the northern portion on the 19-20th. Frost occurred on numerous dates.

Indian Territory.—(See *Oklahoma*.)

Iowa.—The month was abnormally cold and dry, with more than the average amount of sunshine and of bright, clear weather. The mean temperature was 46.0°, or 3.5° below the normal. The highest temperature, 88°, was recorded at Glenwood on the 2d, and the lowest, 0°, at Neola on the 29th. The average precipitation was 0.47, or 2.38 less than normal. The drought was severe on pastures, winter wheat, and rye. The greatest monthly precipitation, 1.38, was recorded at Iowa City, and the least, 0.00, at Decorah and Logan.

Kansas.—The mean temperature was 52.3°, or 3° below the normal. The highest daily temperature, 93°, was recorded at Oswego on the 12th, and the lowest, 11°, at Jaqua on the 28th. The average precipitation, 0.70, was 0.91 less than the normal. The greatest monthly amount, 2.15, was recorded at Macksville, and the least, 0.00, at Paola. Snow occurred on the 4th and 30th, and frost on numerous dates.

Kentucky.—The temperature preserved quite a remarkable uniformity throughout the month. Though the mean temperature was 52.2°, or 5° below the normal, there were no abrupt or marked fluctuations. Frosts, freezing temperatures, and the formation of ice were reported from every station. The highest temperature, 89°, was recorded at Sandy Hook on the 4th, and the lowest, 14°, at Pleasure Ridge Park on the 30th. Rainfall, in the form of light scattered showers, had no effect in allaying the drought. All streams and wells were lower than for many years, and the Ohio River was fordable at many points. The average amount of precipitation was only 1.24, or 1.43 less than normal.

Louisiana.—The mean temperature was 64.3°, or 2° below the normal; that for the northern section was 61.2°, or more than 3° below, and for the southern section, 66°, or a little more than 1° below. The highest temperature, 95°, was recorded at Liberty Hill on the 6th, and the lowest, 30°, at Davis, on the 10th. The average amount of precipitation was 2.82, or 0.65 more than normal; for northern Louisiana, 2.28, and for southern Louisiana, 2.16, or 0.50 and 0.70, respectively, more than the usual amount. There was an average of three days on which rain fell in the northern section, and four in the southern section, the prevailing dates being the 7th and 29th-31st. Southeastern Louisiana had less rain than usual, but from the southwest parishes northeastward to the Florida parishes, the rainfall was above the normal. The weather could not well have been surpassed for harvesting cotton and rice. Until the rains of the last days of the month not much farm work was done, owing to the drought. Frosts occurred in some localities on the 1st, 8-10th, 12th, 14th, 18th, 20th-22d, 25th, and 31st.

Maine.—(See *New England*.)

Maryland.—The mean temperature was 50.3°, or 4.4° below the normal. The highest temperature, 82°, occurred at Jewell on the 19th, and the lowest, 4°, at Deer Park on the 30th. The average amount of precipitation was 1.96, or 0.82 less than the normal amount. The greatest monthly rainfall, 3.59, was recorded at Mardela Springs, and the least, 0.44, at Great Falls. Snow to the amount of a trace was reported from Sunny Side, Oakland, Baltimore, Fallston, Md., and Wilmington, Del. Hail was reported at Westernport on the 31st.

Massachusetts.—(See *New England*.)

Michigan.—The mean temperature was 43.2°, or 5.7° below the normal. The temperature was below the normal on twenty-five days, and above on but six days, the 3d, 5th, 6th, 18th, 26th, and 27th. The highest temperature, 90°, was recorded at Benton Harbor on the 7th, and the lowest, 5°, at Boon on the 21st. Altogether this has been one of the coldest Octobers on record. The average precipitation was 0.96,

decidedly below the normal. The greatest deficiencies appear in the central and southern sections. The greatest monthly rainfall, 3.58, occurred at Sault Ste. Marie, and the least, 0.13, at Hesperia. The ground was bare of snow in all parts of the State on the 15th, but at the end of the month there remained on the ground over the Upper Peninsula, 2.3, over the northern counties, 1.1, and over the central and southern counties, only a trace in scattered localities. This has been one of the driest Octobers for many years; there is a general complaint that wells, creeks, and streams are very low, while the parched condition of the soil is bad for fall seeding.

Minnesota.—The mean temperature was 41.4° , or about 3° below the normal. The coldest periods were on the 8th and 9th, 19th, 20th, 22d, and from the 27th to the close of the month. The 26th was unusually warm; the rest of the month the temperature was about normal; the highest, 81° , was recorded at Moorhead on the 17th, and the lowest, 1° below zero, at Ada on the 29th. The average precipitation was 0.24, or 1.29 less than normal. The rain fell principally on the 14th, 26th, and 27th. The greatest amount, 0.90, occurred at Mazeppa and Tower, and the least, 0.00, at Glencoe. Owing to the drought the rivers, streams, and lakes were unusually dry.

Mississippi.—The weather conditions were mild and equable; no storms and no unusually cold or warm periods. The mean temperature was 60.5° , or about 5° below normal. The highest temperature, 88° , was recorded at Vaiden on the 6th, and the lowest, 26° , at French Camp on the 21st. The average precipitation was 2.25, or 0.57 less than normal. The greatest amount, 7.30, occurred at Moss Point, and the least, 0.20, at Hernando. Rain fell within the State on fifteen days, but was most general on the 7th and 8th and from the 27th to the close of the month. The previous deficiency in precipitation continued and caused very low stages in all the water courses. Frosts occurred on the 1st, 3d, 9th, 10th, 11th, 13th to 24th, and 28th. The southern limit of frost was at Crystal Springs on the 21st. Ice formed at Yazoo City on the 21st and at Pontotoc on the 28th.

Missouri.—The month was unusually cold, with an average deficiency in temperature of from 3.5° to 4.5° in the central and northern sections and 5.0° to 6.0° in the southern section. The mean temperature, 51.0° , was 4.7° below the normal. The highest temperature, 89° , was recorded at Willow Springs on the 16th, and the lowest, 15° , at Unionville on the 29th. The average precipitation was 0.35, or 2.22 less than normal. The greatest amount, 1.56, occurred at Mineral Spring, and the least, 0.00, at Bagnell. This has been one of the driest Octobers for many years. Although the month was especially favorable for gathering the immense corn crop, the drought was very severe on wheat and grasses; in some sections the ground was too dry for seeding, and stock water was reported scarce in nearly all localities at the close of the month. A trace of snow fell at a few stations in the central and western sections.

Montana.—The mean temperature was 46° , or about 2° above the normal. The highest temperature was 90° , at Great Falls on the 5th and Wibaux on the 12th, and the lowest, 0° , at Poplar and Wibaux on the 29th. The average precipitation was 0.34, or 0.50 less than the normal. The greatest amount, 1.70, occurred at Kipp, and the least, "trace," at several stations. Most of the precipitation was in the form of rain, very little snow having fallen.

Nebraska.—The month was cool and dry, giving the lowest temperature and the smallest precipitation yet recorded in the State for October. The mean temperature was 48.1° , or 2° below the normal. The highest temperature, 91° , was recorded at Holdrege on the 5th, and the lowest, 1° , at Lynch and Springview on the 29th. The average precipitation was 0.22, or 1.26 below the normal. The largest amount at any station, 1.20, occurred at Franklin, and the least, 0.00, at several stations.

Nevada.—The mean temperature was 49.9° , or 0.6° above the normal. The localities having more sunshine than usual were the northern portions of Washoe, Humboldt, and Elko, and the western and southern portions of Douglas and Esmeraldo counties. The greatest excess was 10° , at Tuscarora, and the greatest deficiency, 11° , at Wadsworth. The mean temperature steadily, and almost imperceptibly, decreased day by day, the highest, with scarcely an exception, being recorded on the 1st, and the lowest on the 31st. St. Thomas, with a maximum of 100° on the 1st and other dates, registered one extreme, and Carlin, with a minimum of 5° below zero on the 31st, the other. The average precipitation was 0.26, or 0.15 less than the usual amount. The greatest deficiency, 0.95, was recorded at Verdi, and the least, 0.01, at Hot Springs and Hawthorne. The greatest excess, 0.97, was at Sunnyside, and the least, 0.29, at Belmont. The largest amount of precipitation for any station, 1.33, was recorded at Sunnyside, and the smallest, 0.00, at five stations. The snowfall was extremely light, Hamilton reporting a "trace" and Osceola 4.00. Windstorms, with (estimated) velocities of 25 miles or more, occurred at Winnemucca on the 5th and 16th; Verdi on the 6th, 7th, 8th; San Antonio on the 14th, 15th, and 16th, and at Austin and Carson City on the 15th.

New England.—The mean temperature was 49.7° , or 3.2° below the normal. The month has been generally cool and fair, with no extreme cold and no long spells of either mild or cold weather; the coldest was on the 22d and 31st, when most observers recorded their minimum temperature. The average precipitation was 6.10, or 2.13 more than

the usual amount. At New Haven, Conn., Woods Hole, Mass., and all the northern stations there was a deficiency in rainfall, but in eastern and central districts, where the great rain of the 12-14th came, and also the fall on the last night of the month, there was a marked excess. The observer at Framingham, Mass., reports 6.66 more than the usual amount of precipitation. The difference in the rainfall in the southern and northern parts of New England was seldom greater than was shown this month, viz: 10.00 and 11.00 in eastern Massachusetts, and only 0.23 at Burlington, Vt. A "trace" of snow fell over most of New England on the 21st and 22d, and also on the 31st. In northern sections the ground was well covered.

New Hampshire.—(See *New England*.)

New Jersey.—The mean temperature was 49.9° , or 4.5° below the normal. The warmest days were 2d, 3d, 4th, 5th, 6th, 7th, 18th, 27th, and 28th, when the maxima ranged from 66° to 83° . The coldest days were the 10th, 11th, 21st, 22d, 24th, 25th, 26th, 29th, 30th, and 31st, when minima ranging from 18° to 35° were recorded. The average precipitation was 3.60, or 0.19 more than the normal. Precipitation was quite general on the 7th, 8th, 12th, 13th, and 31st, and in the northern section on the 15th. The largest amount recorded at any station was 5.53, at Chester, and the least, 1.62, at Barnegat. Snow flurries occurred on the 9th and 21st, and frosts on the 1st, 2d, 6th, 9th, 10th, 11th, 22d, and 24th.

New Mexico.—The temperature averaged about normal. No decided cold wave appeared until the 30th, the temperature until that date having been quite seasonable. The highest temperature, 84° , was recorded at Eddy on the 17th and Roswell on the 20th, and the lowest, 15° , at Chama on the 30th. The precipitation averaged somewhat above the normal and was fairly well distributed. The largest amount was 2.11, at Roswell, and the smallest, 0.03, at Raton. Average number of days on which precipitation occurred, 4. A few stations reported light flurries of snow about the last of the month.

New York.—The most noticeable characteristics of the weather were an almost continuous deficiency in temperature (the mean being 4.6° below the normal), broken only by a period of abnormal warmth between the 26th and 29th; scanty rainfall in all sections excepting the southeast; an unusually large number of clear or fair days; and the prevalence of strong southwesterly winds. The highest temperature, 76° , was recorded at West Point on the 3d, and the lowest, 11° , at Bloomville on the 30th. The average precipitation was 1.12 less than normal. The average amount of snowfall was 2.7. On the northern plateau the amount ranged from 4.00 to 10.00; on the eastern and western plateaus, from "trace" to 5.00; in other regions it was generally less than 2.00. The largest amount reported, 27.1, occurred at Turin, while at coast stations 0.00 was reported. A drought of extreme severity prevailed in nearly all sections, and streams and wells were reported by several observers as being lower than at any time during the past twenty years. Frosts were frequent during the first week. The first killing frost on Long Island occurred on the 22d.

North Carolina.—The characteristic features of this month were the continued drought, which lasted practically until the 31st, and the general temperature deficiency. The mean temperature, 56.0° , was nearly 4° below the normal. The highest temperature, 88° , was recorded at Rockingham on the 7th, and the lowest, 18° , at Linville on the 10th and 30th. The average precipitation was 1.86, or 1.80 below the normal. There was an average of but four rainy days. The largest monthly fall, 2.99, occurred at Tarboro, and the smallest, 0.21, at Asheville. The great drought was completely broken on the 31st by general rains, which amounted to an inch or more at a large number of stations. The most serious effects of the drought were to prevent fall plowing and seeding, and to interfere, to a considerable extent, with the running of mills. It was, however, advantageous to the maturing and gathering of late crops, but, apparently, had the effect of increasing the amount of sickness. Frosts occurred frequently; those early in the month did considerable damage to tobacco in the Piedmont section. Ice formed on the 1st, 2d, 3d, 10th, 11th, 20th, 21st, 22d, 25th, 29th, and 30th.

North Dakota.—The month was characterized by an average low temperature and a considerable deficiency in precipitation. There was a general excess of temperature of from 2° to 15° above the normal during the first part of the month, which excess gradually decreased toward the end of the month, when the daily temperatures fell considerably below the normal. The highest temperature, 85° , was recorded at Gallatin on the 12th and 17th, and the lowest, -12° , at White Earth on the 28th, which is lower than any previous record for October. The average precipitation was 0.25, or considerably below the usual amount, the rainfall being very unevenly distributed. The largest monthly fall, 0.65, occurred at University, and the smallest, "trace," at Amenla, Jamestown, Washburn, and Willow City.

Ohio.—The mean temperature was 46.9° , or 4.5° below the normal. The highest temperature, 84° , was recorded at Hebbardsville on the 3d and New Paris on the 5th, and the lowest, 8° , at Coalton on the 30th. The average precipitation was 1.22, or 1.25 less than normal. The greatest amount, 2.97, occurred at Harbor, and the least, "trace," at Dupont. Snow fell at various places in the northern and middle sections on the 3d, 8th, 9th, 12th, 18th, 19th, 20th, 21st, 23d, 24th, 26th, 27th, 28th, 29th, 30th, and 31st, the total amount ranging from "trace"

at most stations to 10.00 at Harbor. The drought is one of the severest on record. Frosts occurred at various points every day, except the 5th, and were mostly heavy enough to kill tender vegetation.

Oklahoma.—The mean temperature was 56.9°, or 4.6° below the normal. The highest temperature, 96°, was recorded at Lehigh on the 16th, and the lowest, 21°, at Lehigh on the 28th. The average precipitation was 3.14, or 0.42 above the normal amount. The greatest monthly amount, 4.59, occurred at Fort Sill, and the least, "trace," at Lehigh. Frosts occurred on the 1st, 9th, 12th, 13th, 19th, 20th, 21st, 24th, 25th, 28th, and 31st.

Oregon.—The month was phenomenally dry; in fact, the driest ever experienced within the memory of any pioneer. The average temperature was 53.6°, or 1.6°, above the normal. In the eastern part, however, the temperature was decidedly higher than the average. The highest temperature, 92°, was recorded at Canyon City on the 15th, and the lowest, 6°, at Burns on the 29th. The average precipitation was 0.09, being 3.65 less than, or about 2½ per cent of the usual amount. The greatest amount for the month, 1.37, occurred at Glenora, and the least, 0.00, at eight stations west of the Cascades, and twelve east of them. Frosts occurred at one or more stations on every day except the 1st, 2d, 3d, 5th, 6th, 8th, and 10th to 13th.

Pennsylvania.—The mean temperature was 47.3°, or 2.9° below the normal. The highest temperature, 78°, was recorded at Coatesville on the 3d, South Bethlehem on the 5th and 6th, and at Huntingdon on the 19th, and the lowest, 17°, at Dyberry on the 22d, Hollidaysburg on the 23d and 30th, and Huntingdon on the 30th. The average precipitation was 1.99, or 1.65 less than the normal. The largest monthly amount, 4.63, occurred at Easton, and the smallest, 0.45, at Davis Island Dam. The long continued drought extended until the 12th or 13th, when the surface drought was practically broken in the Delaware Basin and in the eastern portions of the Susquehanna Basin. Heavy rains occurred again in these sections on the 31st. In the Ohio Basin the drought continued, the total rainfall for that section averaging only 0.90. Previous to the breaking of the drought in the Delaware Basin the water in the Delaware River at Philadelphia was quite brackish. Hail occurred on the 8th and 31st; snow, on the 9th, 15th, 17th, 20th, 21st, 22d, 27th, 29th, 30th, and 31st.

Rhode Island.—(See *New England*.)

South Carolina.—The weather conditions were extremely favorable for gathering crops, especially corn and cotton, but were unfavorable for pasturage and late root crops. Streams were low, and some wells went dry. The mean temperature was 61.5°, or 2.7° below the normal. The highest temperature, 95°, was recorded at Gillisonville on the 7th, and the lowest, 28°, at Greenwood on the 31st. The average precipitation, 1.15, was 1.95 below the normal, or about 37 per cent of the usual amount. The greatest monthly amount, 2.71, occurred at Society Hill, and the least, 0.09, at Allendale. Frosts occurred on the 1st, 7th, 10th, 19th, 20th, 21st, 22d, and 24th. That on the 20th and 21st in the western counties killed vegetation; in other sections the injury by frost was slight.

South Dakota.—The month was unusually dry, the effect on streams and shallow wells being quite noticeable. The weather was, however, generally favorable for the late thrashing of small grain and stock feeding on the ranges. The mean temperature was 45.0°, or about 2° below the normal. The highest temperature, 89°, was recorded at Cherry Creek (Leslie P. O.) on the 12th, and the lowest, 11° below zero, at Shiloh, on the 29th. The average precipitation was 0.20, or 1.14 less than the usual amount. The greatest monthly amount, 0.60, occurred at Bowdle, and the least, "trace," at five stations.

Tennessee.—The mean temperature was 53.4°, or several degrees below the normal, and is the lowest recorded during the past thirteen years. The highest temperature, 89°, occurred at Harriman on the 19th, and

the lowest, 22°, at Elizabethton on the 30th. The average precipitation was 1.89, or nearly 1.00 less than normal. The greatest monthly amount, 4.20, occurred at Sewanee, and the least, 0.60, at McKenzie. The drought was partly broken on the 7th and 8th, but it was not until the 31st that general soaking rains prevailed. Frosts and thin ice were reported from various stations throughout the State from the 1st to the 31st.

Texas.—The temperature averaged 4.1° below the normal. There was a general deficiency of temperature throughout the State. The highest was 96°, at Houston, on the 18th, and the lowest, 30°, at Wichita Falls, on the 8th. The precipitation was very irregularly distributed, but averaged only about 0.04 less than the usual amount. The greatest monthly amount, 6.86, occurred at Temple, and the least, 0.00, at Fort Ringgold. Frosts occurred on the 13th, 14th, 15th, 19th, 20th, 28th, 29th, and 31st.

Utah.—The mean temperature was 49.2°; the highest recorded, 95°, occurred at St. George on the 2d, and the lowest, 10°, at Castle on the 31st, and at Soldiers Summit on the 29th. The average precipitation was 0.56. The greatest monthly amount, 1.28, occurred at Grover, and the least, 0.04, at Logan. Snow, to the depth of 1.5 fell at Moroni, and inappreciable amounts at Grover and Loa.

Vermont.—(See *New England*.)

Virginia.—The month did not show any great variations in temperature, but preserved a rather uniform condition throughout. There were local changes where the range was considerable, but for the State, as a whole, no great changes are apparent. The mean temperature was 52.5°; the highest was 87°, at Bob Air, on the 4th, and the lowest, 14°, at Blacksburg on the 30th. The average precipitation, 1.71, was somewhat below the normal, though it fell in a very beneficial manner—a series of gentle showers. The greatest monthly amount was 4.15, and occurred at Birdsneat, and the least, 0.16, at Monterey. Frosts occurred on the 1st, 2d, 3d, 4th, 9th, and 10th, and ice on the 1st, 2d, 3d, 4th, 10th, 21st, 22d, 29th, and 30th.

Washington.—The mean temperature was 50.9°, or only 0.7° above the normal. The highest temperature was 85°, at Centerville on the 9th, and at Kennewick on the 13th, and the lowest, 12°, at Fort Spokane on the 27th. The average precipitation, 0.33, was 2.63 less than the usual amount. The greatest monthly amount was 1.70, at Monte Cristo, and the least 0.00, at several stations.

West Virginia.—The mean temperature was 48.0°, or about 5° below the normal. The highest temperature recorded was 89°, at Nuttallburg and Pennsboro on the 4th, and the lowest, 8°, at Nuttallburg on the 31st. The rainfall was extremely light, the average, 1.29, being about 2.00 less than the usual amount. The greatest monthly amount was 2.25, and occurred at Beverly, and the least, 0.16, at Harpers Ferry. Snow occurred on the 7th, 8th, and 9th, and sleet on the 31st.

Wisconsin.—Low midday and cold night temperatures, below the freezing point, prevailed generally throughout the month, rendering it the coldest October on record. The mean temperature was 41.9°, or 6.0° below the normal. The highest temperature reported was 80°, at Grantsburg on the 4th, and the lowest, 1.0°, at Valley Junction on the 30th. The average precipitation was 0.84, or 1.89 less than the usual amount. The greatest monthly amount was 1.40 at Koepenick, and the least, 0.04, at Grantsburg. The rainfall was not only deficient but was poorly distributed. The general droughty conditions continued; lakes and streams were drying up and forest and marsh fires increasing in number and extent. Snow fell during the last week and was from 1.00 to 4.00 deep over the northern portion at the close of the month.

Wyoming.—The mean temperature was 45.0°, or about normal. The highest temperature reported was 89°, at Wheatland on the 1st, and the lowest, 9°, at Lusk on the 28th. The average precipitation was 0.70, also about the usual amount. The greatest monthly rainfall was 2.00, at Wheatland, and the least, 0.00, at Lusk.

SPECIAL CONTRIBUTIONS.

REPORT UPON THE EARTHQUAKE OF OCTOBER 31, 1895.

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An earthquake of sufficient severity to arouse many persons from sleep and otherwise attract notice occurred shortly after 5 a. m. ninetieth meridian time, of October 31. The damage resulting therefrom was confined to the overthrow of some chimney tops, the cracking of walls of brick or masonry buildings, the falling of plaster, and the breaking of household ornaments, etc. The disturbance was felt over a comparatively extensive region, embracing New Mexico and Nebraska on the west, some portions of Canada on the north, Louisiana and Georgia on the south, and North Carolina and the District of Columbia on the east.

Without special solicitation of information relating to this earthquake, the Weather Bureau has received through its

corps of observers, and from the Geological Survey and a few other sources, about 300 reports, abstracts of which are given at the close of this account.

Earlier shocks.—An earthquake on October 11 was reported by several observers, as follows:

A. S. Ammerman, Rochford, S. Dak.: At 5.55 p. m.; lasted seven seconds; a low rumbling noise; only one shock felt; intensity light, on a scale of 5; appeared to travel from northwest to southeast.

P. Haunnerquist, Farmingdale, S. Dak.: Lasted about one minute; like a wagon going past the house; intensity very light.

W. H. Zimmerhoff, Hill City, S. Dak.: At 7.30 p. m.; lasted two or three minutes; rumbling like a heavy wagon; only one shock felt; intensity light.

Fred. J. Cross, Keystone, S. Dak.: Felt at 7.15 p. m. sun-